



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification : C12N 15/00, C12Q 1/68	A1	(11) International Publication Number: WO 97/35966 (43) International Publication Date: 2 October 1997 (02.10.97)
(21) International Application Number: PCT/US97/04715 (22) International Filing Date: 20 March 1997 (20.03.97) (30) Priority Data: 08/621,430 25 March 1996 (25.03.96) US 08/621,859 25 March 1996 (25.03.96) US 08/650,400 20 May 1996 (20.05.96) US (60) Parent Applications or Grants (63) Related by Continuation US 08/621,430 (CIP) Filed on 25 March 1996 (25.03.96) US 08/621,859 (CIP) Filed on 25 March 1996 (25.03.96) US 08/650,400 (CIP) Filed on 20 May 1996 (20.05.96) (71) Applicant (for all designated States except US): MAXYGEN, INC. [US/US]; 3410 Central Expressway, Santa Clara, CA 95051 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): MINSHULL, Jeremy [GB/US]; Apartment No. 1, 1130 Shrader Street, San		Francisco, CA 94117 (US). STEMMER, Willem, P., C. [NL/US]; 108 Kathy Court, Los Gatos, CA 95030 (US). (74) Agents: FITTS, Renee, A. et al.; Townsend and Townsend and Crew L.L.P., 8th floor, Two Embarcadero Center, San Francisco, CA 94111-3834 (US). (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i>
(54) Title: METHODS AND COMPOSITIONS FOR CELLULAR AND METABOLIC ENGINEERING (57) Abstract <p>The present invention is generally directed to the evolution of new metabolic pathways and the enhancement of bioprocessing through a process herein termed recursive sequence recombination. Recursive sequence recombination entails performing iterative cycles of recombination and screening or selection to "evolve" individual genes, whole plasmids or viruses, multigene clusters, or even whole genomes. Such techniques do not require the extensive analysis and computation required by conventional methods for metabolic engineering.</p>		